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Thu-Mo-Or17-06: From Manufacture to Assembly of the 43 T Grenoble Hybrid Magnet

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The Grenoble Hybrid magnet is a modular platform applying resistive and superconducting technologies to deliver various continuous high magnetic field and flux configurations. They range from 43 T in 34 mm diameter with 24 MW down to 9 T in 800 mm with the superconducting coil alone. The key design parameters are recalled including the specifically developed conductor, the large bore superconducting outsert coil, the cryostat with the eddy-current shield and the cryogenic infrastructure. The status of the project is given together with the main problems encountered and solved.

The ongoing validation phases of the resistive Bitter and polyhelix inserts performed at up to 24 MW is also presented. Thanks to the ongoing upgrade of the electrical power installation to 36 MW at the LNCMI-Grenoble, it will be possible to increase the total field to up to 45-46 T in the future. The support structure of the superconducting outsert had already been adapted during the design phase and a material development program initiated for the resistive insert.

All major equipment of the hybrid magnet has been built, tested and delivered to LNCMI-Grenoble, where integration and assembly is close to completion. The commissioning of the overall hybrid magnet system will start in 2020 and will be followed eventually by the first run of a new axion dark matter search experiment.

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